US Army Corps
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Northwestern Division

# Dworshak Water Supply Forecast – 2007 Update

*Randy Wortman – 28 Feb 2007*

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# Previous Models

- NRCS93 (Garen)
  - 1961-1992 data
  - Using SOI and PC Regression
- NRCS95 (Garen)
  - 1961-1995 data
  - Dropped Elk River 1S November precipitation from 1-Dec equation
- NRCS99 (Moore)
  - 1965-1999
  - Changes to many variables

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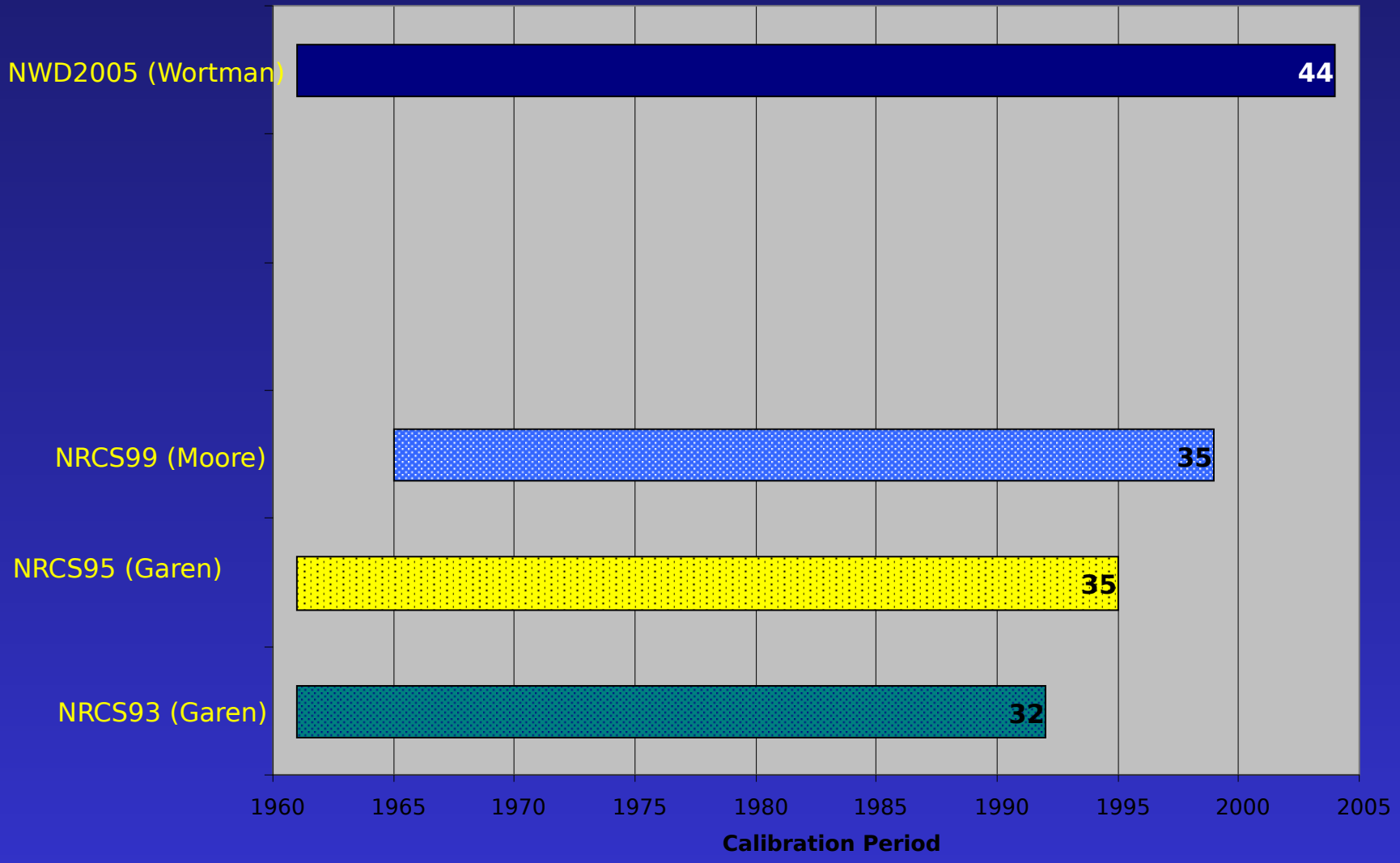
# Dworshak Forecast Models and Data Years Utilized



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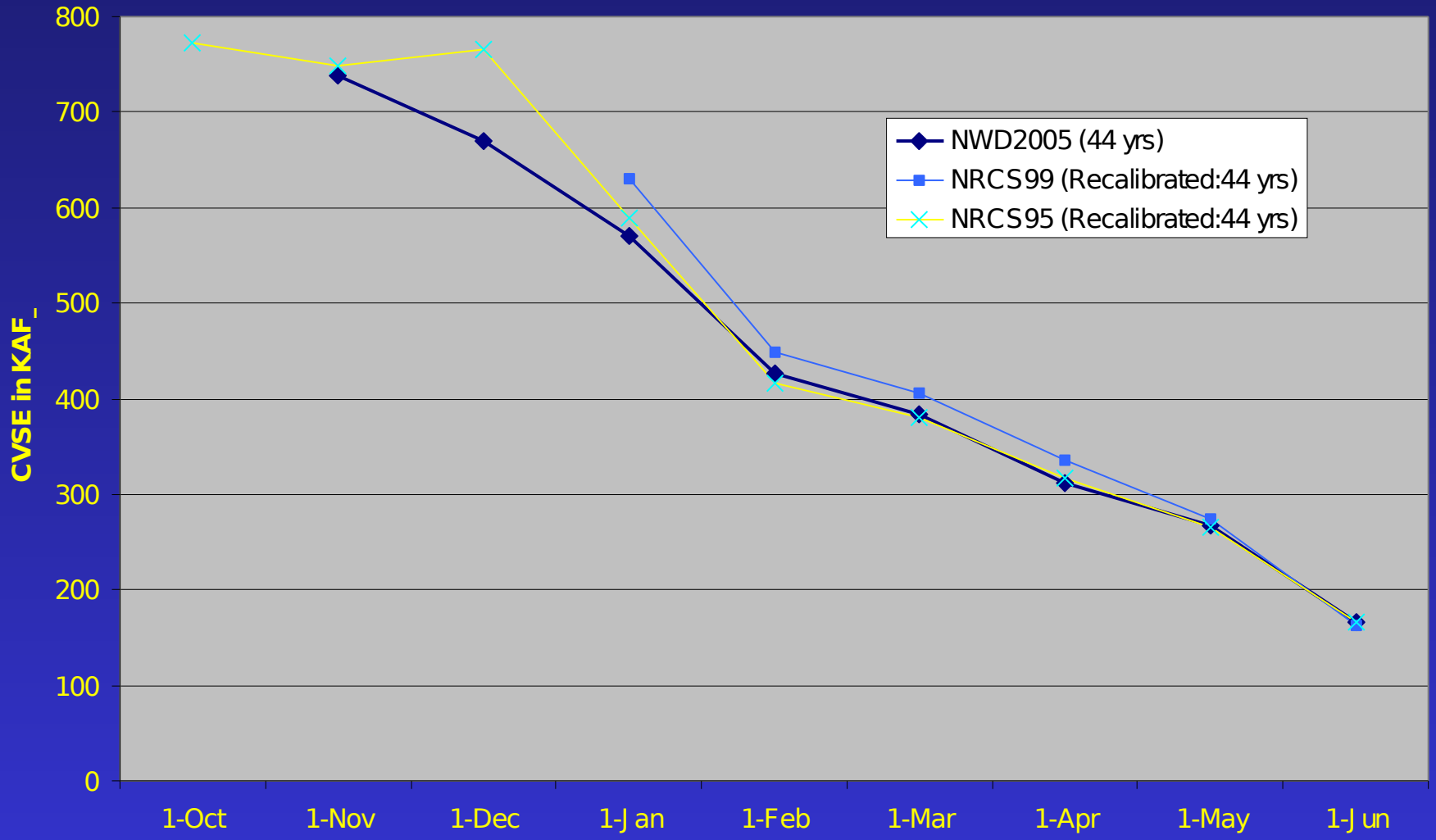
# Model Comparison

## Dworshak April-July Runoff Forecasts
## Principal Components Regression Models
## Cross-Validation Standard Error Statistic



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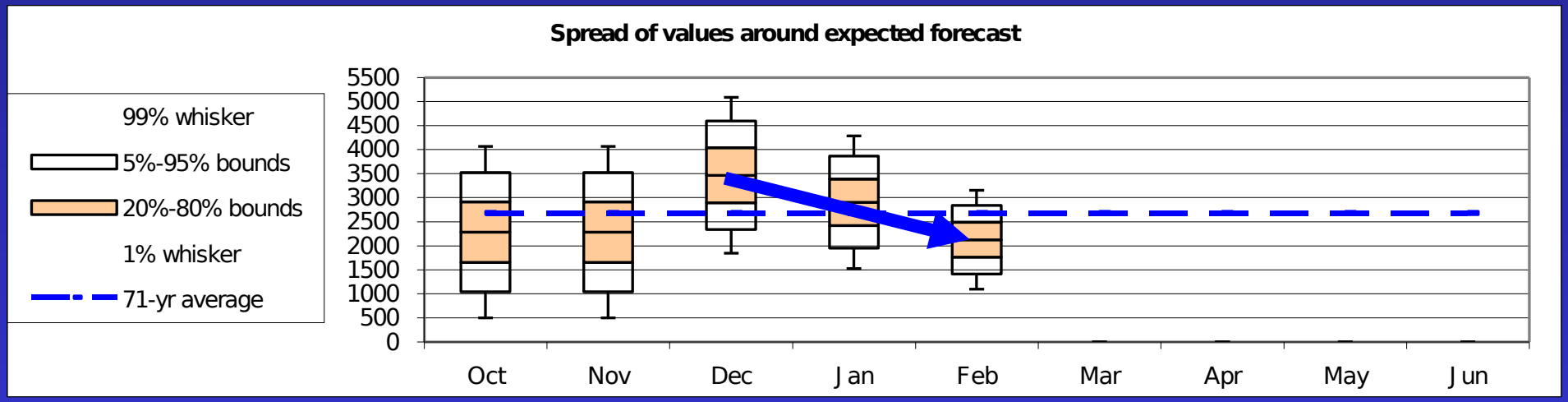
# Dworshak Water Supply Forecast WY 2007

| Forecast Date>> | Oct | Nov | Dec | Jan | Feb | Mar |
|---|---|---|---|---|---|---|
| Apr-Jul Runoff Forecast | 2283 | 2283 | 3465 | 2905 | 2126 | |



# Variables used in Dworshak WSF

**Apr-Jul Runoff Forecast Calculation:**

| Variable | Month | Observed Value | % of Average | Regression Coefficient | Marginal Runoff (KAF) |
|---|---|---|---|---|---|
| | | A | | B | =A*B |
| SOI | Sep | -0.70 | | 344.40 | -241.1 |
| Headquarters Precip | Nov | 10.79 | 218% | 182.72 | 1971.5 |
| Intercept | | 1 | | 1734.55 | 1734.6 |
| | 1-Dec Forecast (KAF) | | | ? | 3465.0 |

1-Dec: Mostly Precipitation

**Apr-Jul Runoff Forecast Calculation:**

| Variable | Month | Observed Value | % of Average | Regression Coefficient | Marginal Runoff (KAF) |
|---|---|---|---|---|---|
| | | A | | B | =A*B |
| SOI | Sep | -0.70 | | 271.68 | -190.2 |
| Headquarters Precip | Nov | 10.79 | 218% | 99.83 | 1077.1 |
| Headquarters Precip | Dec | 4.36 | 85% | 45.83 | 199.8 |
| Elk Butte SWE | 1-Jan | 14.4 | 86% | 9.77 | 140.7 |
| Hemlock Butte SWE | 1-Jan | 19.0 | 96% | 12.05 | 228.9 |
| Hoodoo Basin SWE | 1-Jan | 18.2 | 95% | 13.61 | 247.7 |
| Pierce SWE | 1-Jan | 3.0 | 70% | 35.14 | 105.4 |
| Intercept | | 1 | | 1095.65 | 1095.6 |
| | 1-Jan Forecast (KAF) | | | ? | 2905.1 |

1-Jan: Mostly Precipitation, Some Snow

**Apr-Jul Runoff Forecast Calculation:**

| Variable | Month | Observed Value | % of Average | Regression Coefficient | Marginal Runoff (KAF) |
|---|---|---|---|---|---|
| | | A | | B | =A*B |
| SOI | Sep | -0.70 | | 108.05 | -75.6 |
| Elk Butte SWE | 1-Feb | 22.40 | 83% | 19.57 | 438.3 |
| Hemlock Butte SWE | 1-Feb | 26.60 | 83% | 17.27 | 459.4 |
| Hoodoo Basin SWE | 1-Feb | 24.60 | 82% | 19.13 | 470.6 |
| Pierce SWE | 1-Feb | 6.00 | 77% | 48.51 | 291.1 |
| DWR January Inflow | Jan | 144.40 | 71% | 0.895 | 129.2 |
| Intercept | | 1 | | 413.05 | 413.1 |
| | 1-Feb Forecast (KAF) | | | ? | 2126.1 |

1-Feb: No Precipitation, Mostly Snow Stations

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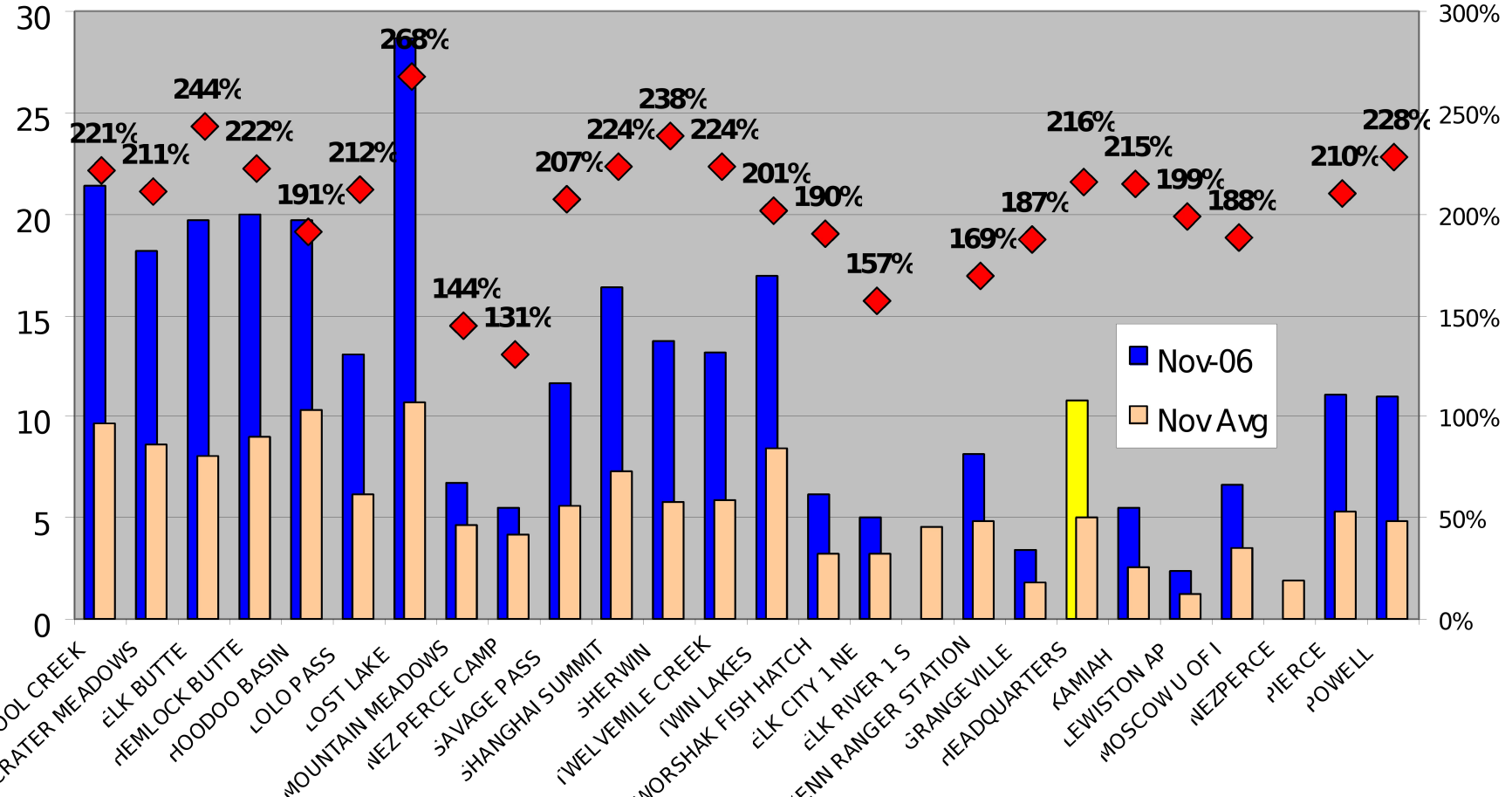
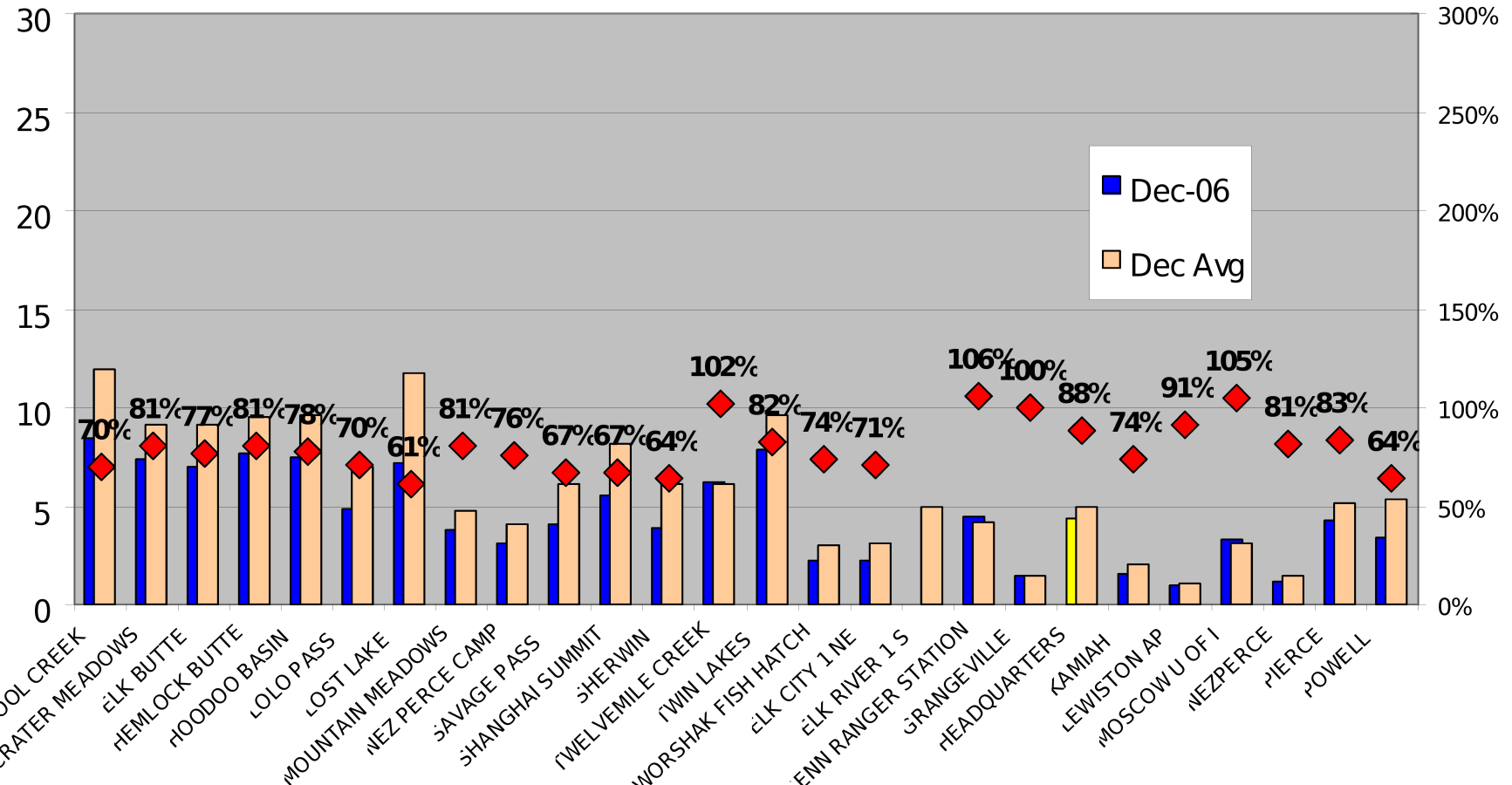
# Clearwater River Basin - November Precipitation



# Clearwater River Basin - December Precipitation



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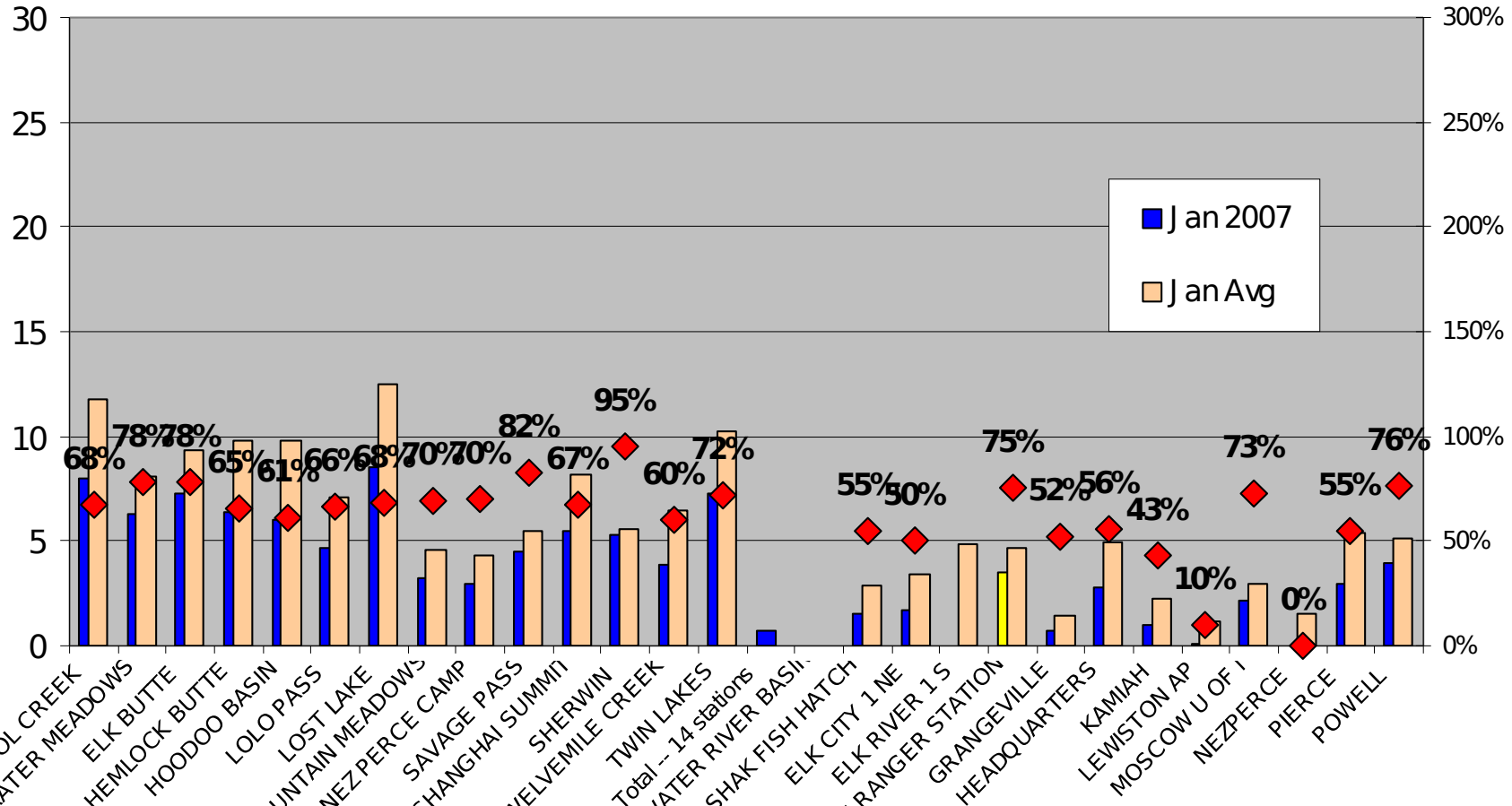
# Clearwater River Basin - January Precipitation



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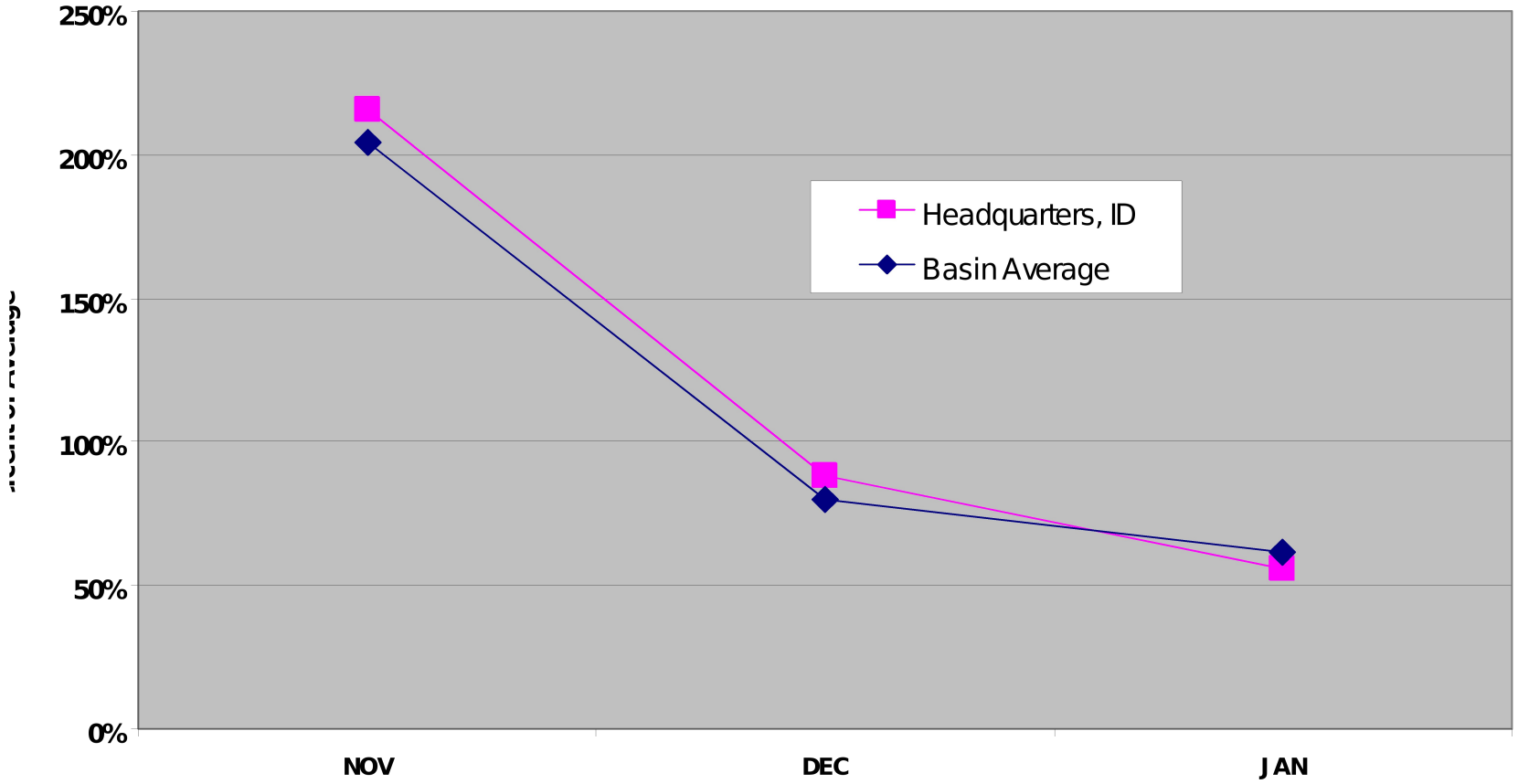
## Clearwater Basin Precipitation
## Monthly average for all gauges in basin



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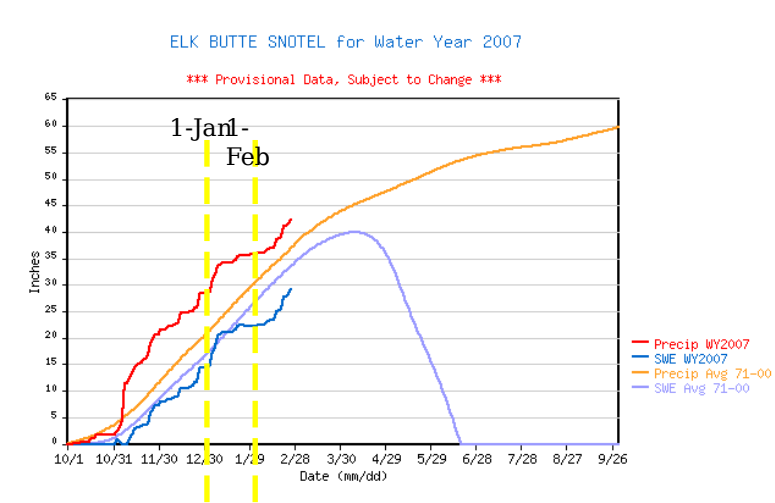
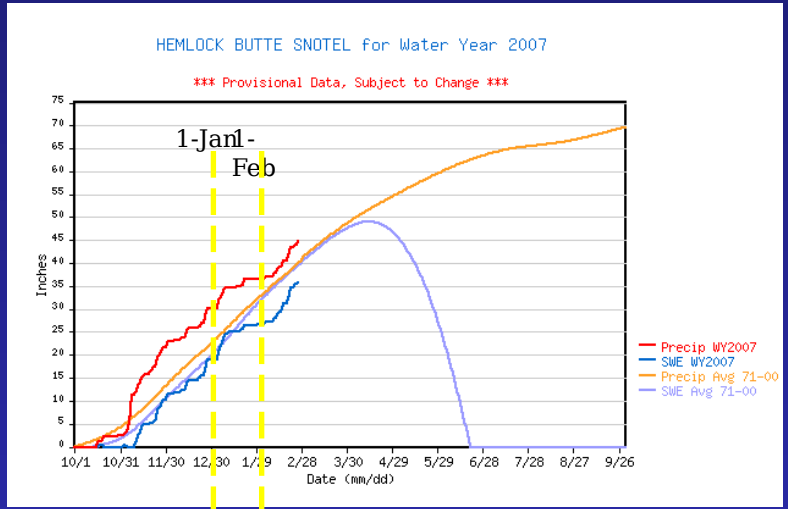
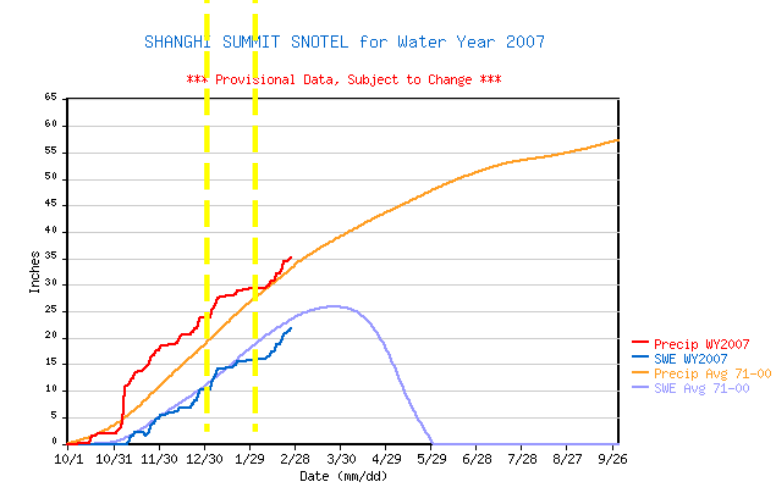
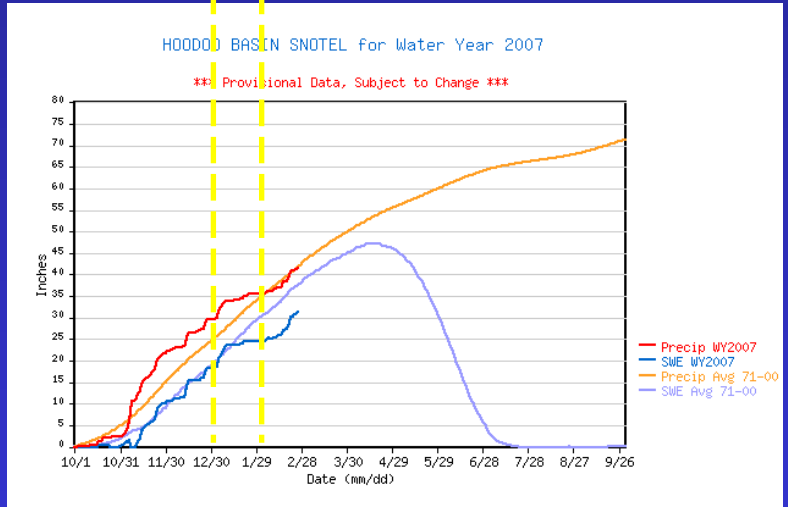
# Dworshak Basin Snow Stations

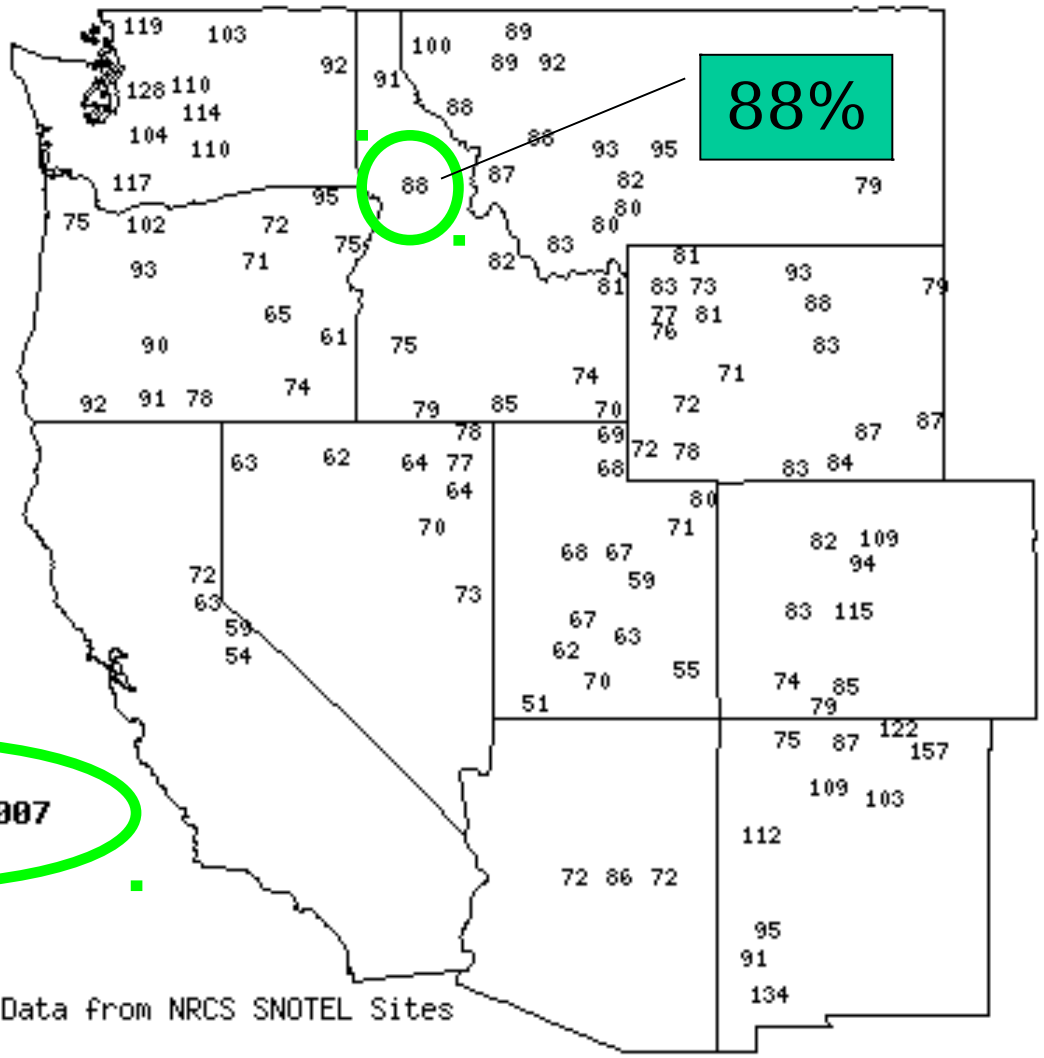




SHANGHI SUMMIT SNOTEL for Water Year 2007
*** Provisional Data, Subject to Change ***
Inches
Date (mm/dd)
10/1 10/31 11/30 12/30 1/29 2/28 3/30 4/29 5/29 6/28 7/28 8/27 9/26
Precip WY2007
SWE WY2007
Precip Avg 71-00
SWE Avg 71-00


HOODOO BASIN SNOTEL for Water Year 2007
*** Provisional Data, Subject to Change ***
Inches
Date (mm/dd)
10/1 10/31 11/30 12/30 1/29 2/28 3/30 4/29 5/29 6/28 7/28 8/27 9/26
Precip WY2007
SWE WY2007
Precip Avg 71-00
SWE Avg 71-00

## Basin Average Snow Water Content. ( % of Average.)




**Report Date:**

**FEBRUARY 27 , 2007**

Provisional Data
Based on Mountain Data from NRCS SNOTEL Sites

Data provided by
Water and Climate Center
Natural Resources Conservation Service
Portland, Oregon

Western Regional Climate Center
Desert Research Institute
Reno, Nevada

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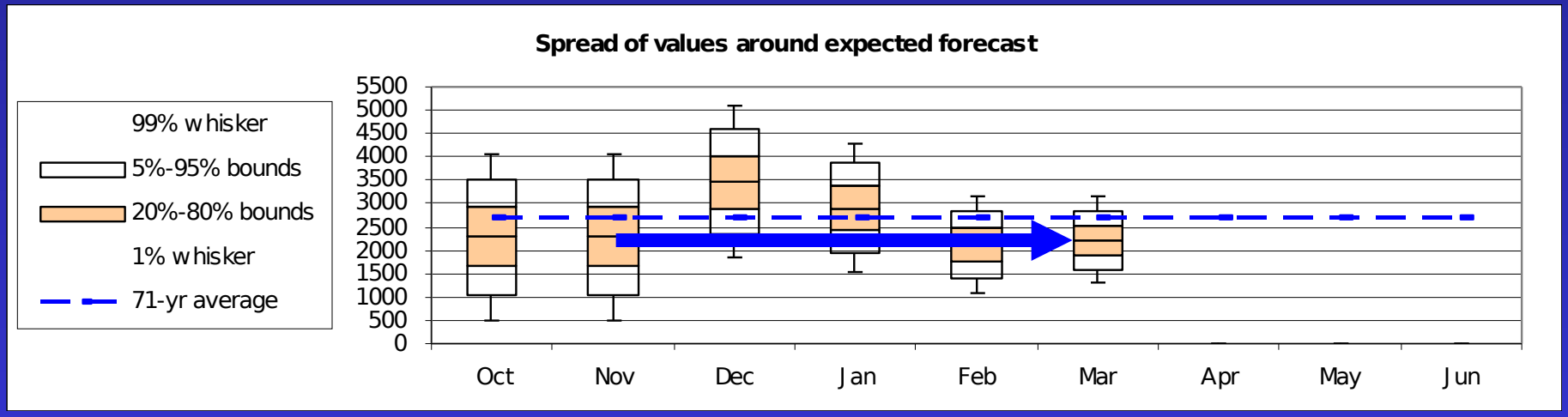
# Dworshak Water Supply Forecast
# WY 2007
# (1-March Sneak Preview!!)
# *UNOFFICIAL* EARLY-BIRD FORECAST

| Dworshak : March Runoff Forecast & Flood Control Calculation | | | | | | WY | 2007 |
|---|---|---|---|---|---|---|---|
| **Runoff Forecast and Flood Control** | | | | | 1929-1999 Average | Percent of Average | |
| **Most Probable Runoff Volume** | **Apr-Jul** | **2218** | **KAF** | | 2683 | 83% | |
| | **May-Jul** | **1637** | **KAF** | | 1980 | 83% | |

| Forecast Date>> | Oct | Nov | Dec | Jan | Feb | Mar |
|---|---|---|---|---|---|---|
| Apr-Jul Runoff Forecast | 2283 | 2283 | 3465 | 2905 | 2126 | 2218 |



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# DWR ESP Flows for 27 Feb 2007